Title: Selective Acetalization of Glycerol with Acetone Over Nickel Nanoparticles Supported on Multi-Walled Carbon Nanotubes

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Abstract: The use of multi-walled carbon nanotubes for catalytic applications is acquiring great interest. In this work, heterogeneous catalysts were prepared by incorporating nickel nanoparticles into MWCNTs and were characterized by BET, surface acidity, FTIR, XRD, Raman spectroscopy, and TEM analysis. The Ni-containing catalysts have presented unique catalytic performance in the selective formation of glycerol ketal and acetal via the solventless acetalization with acetone. The formation of glycerol acetal via glycerol ketalization with acetone can be considered as one of the earlier attempts in this field. Experimental investigations revealed that at 40^{O}C, Ni(1.8)/MWCNTs facilitated the conversion of 96 % glycerol with corresponding selectivity of 72 and 28 % toward ketal and acetal, respectively, within 3 h. The unique catalytic performance of this catalyst is mainly attributable to its high acidity and the structural characteristics. The stability of the catalytic activity was examined upon recycling the catalyst for four consecutive batch runs.